Technical Description

The brief circuit description is listed as below:

1) U2 acts as 2.4GHz Bluetooth Module (BT1213H).
2) U1 acts as Linear Voltage Charging Chip.
3) U4~U6 act as voltage Regulator of battery portion.
4) X1 acts as a 26MHz of Crystal oscillator for U2 BT Module.
5) U3 acts as Audio Amplifier.
6) U3 of 2.4GHz RF Bluetooth Module acts as Flash.
7) U1 of 2.4GHz RF Bluetooth Module acts as BT transceiver chipset.
8) U2 of 2.4GHz RF Bluetooth Module acts as EEPROM.

Antenna Type: Internal Integral antenna
Antenna Gain: 0dBi
Nominal rated field strength: 99.1dBμV/m at 3m
Maximum allowed field strength of production tolerance: +/- 3dB

BOOMTECH SEMICONDUCTORS CO.,LTD

Product Specification

Model :	**BT1213H**
REV :	**V1.0**
DRAWN BY：	
CHECKED BY：	
APPD BY:	

1. Introduction

Boomtech Semiconductors Co., Ltd the pioneer of the Bluetooth 4.0 modules BT1213H which is a high performance, cost effective, low power and compact solution. The Bluetooth module provides a complete 2.4GHz Bluetooth system based on CSR 8635 chip which is a single-chip radio and baseband IC for Bluetooth 2.4GHz systems including basic rate, EDR to 3Mbps and Bluetooth low energy

2. Key Features

• Fully Qualified Single-chip Bluetooth® v4.0 System
•-91dBm (typical) π/4 DQPSK receiver sensitivity
and -81dBm (typical) 8DPSK receiver sensitivity
• A2DP v1.2, multipoint A2DP support enables connection to 2 A2DP source devices for music playback
• CSR's latest CVC technology for narrowband and wideband voice connections including wind noise reduction
• AVRCP v1.4
• Wideband speech supported by HFP v1.6 and mSBC codec
•Audio interfaces: I²S and PCM
• Stereo codec with 1 microphone input
• 5-band fully configurable EQ
• SBC, MP3 and AAC decoder support
• Wired audio support
Supported sample rates of 8, 11.025, 16, 22.05, 32,44.1, 48 and 96kHz (DAC only)

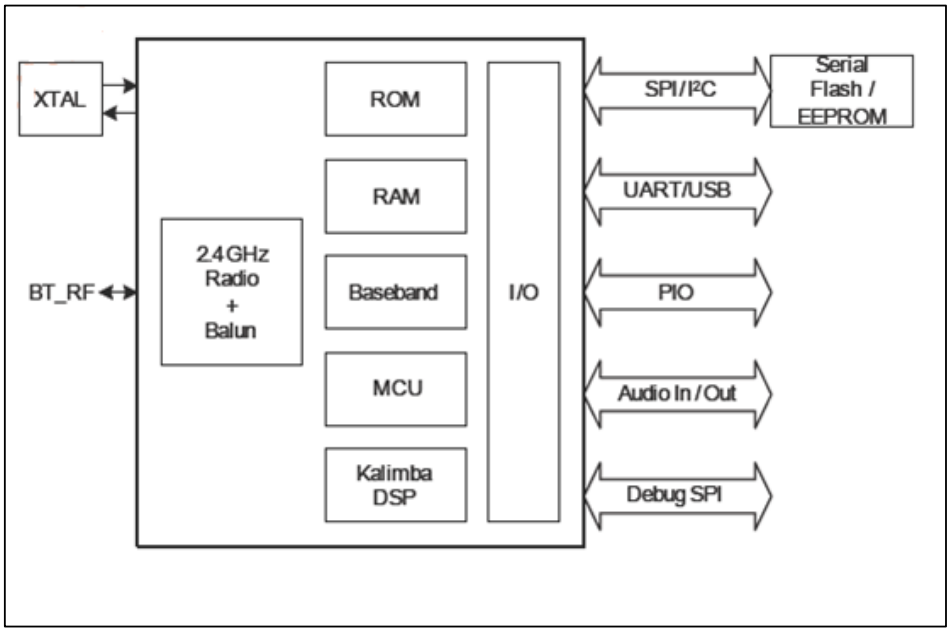
■Bluetooth low energy
• Dual-mode Bluetooth low energy radio
• Support for Bluetooth basic rate / EDR and low energy connections
• 3 Bluetooth low energy connections at the same time as basic rate A2DP

• Slim module with 24.5mm x 14.1mm x 2.0mm
• RoHS Compliant

3. Applications

• Stereo speakers
• Speakerphones
• Handsfree car kits
• 1-mic stereo headset or headphones

4. Block Diagram

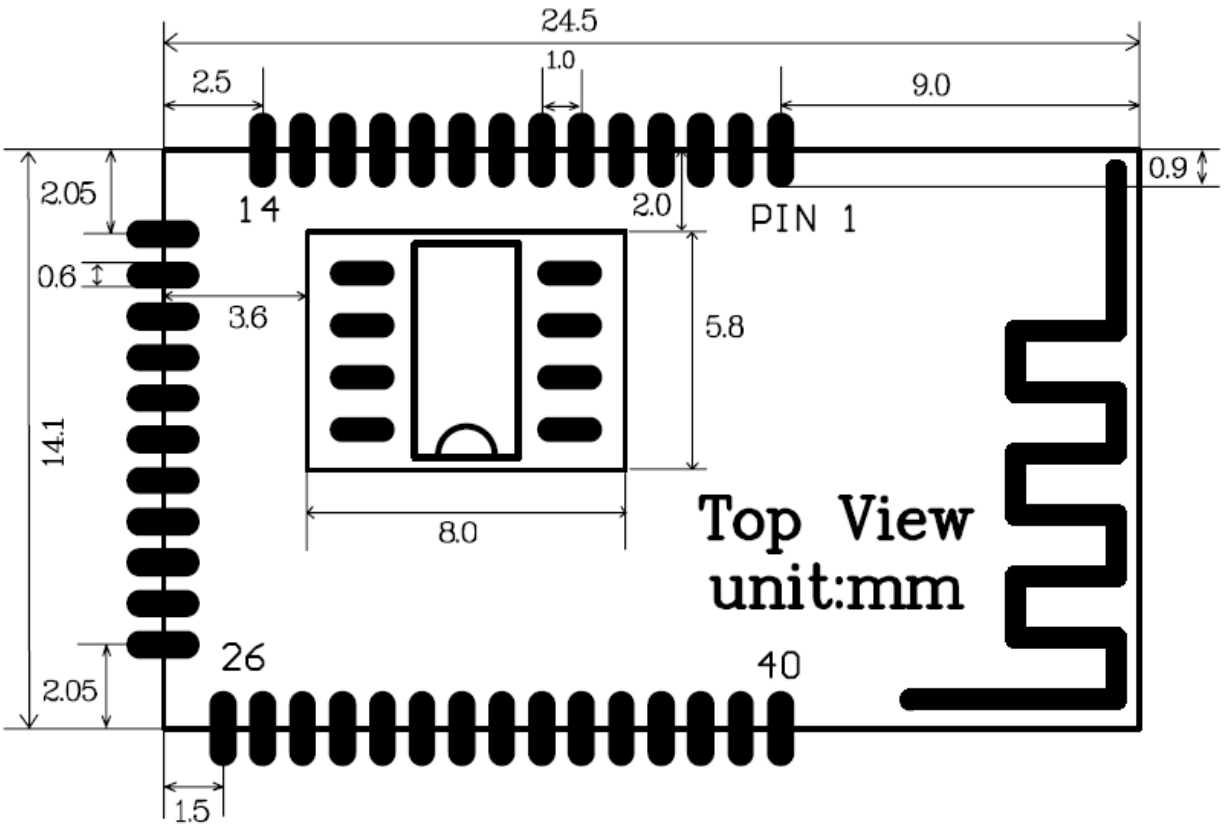


5. General specifications

Model Name	BT1213H		
Bluetooth Standard	Bluetooth v4.0 Standard		
Dimension	24.5mm x 14.1mm x 2.0mm		
Electrical Characteristics RF			
Frequency Range	2402～2480MHz		
RF Transmit Power	8dBm(typ)		
Receive Sensitivity	-91dBm		
Electrical Characteristics(Absolute Maximum Ratings)			
Pin Name	Min	Max	Unit
VBAT	-0.4	4.4	V
CHARGE	-0.4	5.7	V
LED(0:1)	-0.4	4.4	V
PIO	-0.3	3.6	V
Recommended Operating Conditions			
VBAT	/	4.2	V
CHARGE	/	5	V
LED(0:1)	/	4.2	V
PIO	/	1.8	V
Operating Temperature Range	-10	70	℃
Storage Temperature	-40	85	℃

6. Module Package Information

6.1 Pinout Diagram and package dimensions



6.2 Module Pin descriptions

PIN NO.	Pin Name	Description
1	GND	Ground
2	UART_TX	UART data output for debug only / PIO15
3	UART_RX	UART data input for debug only / PIO14
4	UART_RTS	UART request to send, active low / PIO16
5	UART_CTS	UART clear to send,active low / PIO17
6	PIO	for debug only
7	PIO	for debug only
8	PIO	for debug only
9	PIO	for debug only
10	SPI_EN	SPI/PCM select input
11	PCM1_IN	PCM1 synchronous data input/SPI_MOSI

12	PCM1_CLK	PCM1 synchronous data clock/SPI_CLK
13	PCM1_OUT	PCM1 synchronous data output/SPI_MISO
14	PCM1_SYNC	PCM1 synchronous data sync/SPI_CS
15	RESET	Reset if low. Input debounced so must be low for >5ms to cause a reset
16	LED2(BLUE)	LED driver(Open drain output)
17	LED1(RED)	LED driver(Open drain output)
18	MFB/POWER	Power on/off input key indication
19	CHARGE	Internal charger input for charging(5V)
20	VBAT	Battery Power supply input for 3.0~4.2V
21	1V8	Internal 1.8V
22	GND	Ground
23	USB_N	USB data minus
24	USB_P	USB data plus with selectable internal 1.5kΩ pull-up resistor
25	PIO7	Programmable input / output line 7
26	PIO/0	Programmable input / output line 0
27	PIO6	Programmable input / output line 6
28	PIO18	Programmable input / output line 18
29	PIO21	Programmable input / output line 21
30	LED3	LED driver(Open drain output)
31	LINE/MIC_AN	LINE/MIC_AN input negative
32	LINE/MIC_AP	LINE/MIC_AP input positive
33	MIC_BIAS	Microphone bias
34	LINE_BN	LINE_BN input negative
35	LINE_BP	LINE_BP input positive
36	SPK_RN	Speaker output negative，right
37	SPK_RP	Speaker output positive，right
38	SPK_LN	Speaker output negative，left
39	SPK_LP	Speaker output positive，left
40	GND	Ground

7. Example Application Schematic